

Quiz Set 5: Momentum.

1. In terms of momentum, why do padded dashboards make automobiles safer?
2. In terms of momentum why are nylon ropes, which stretch under a tension load, favored by mountain climbers over less stretchy ropes?
3. When jumping from some height, why is it safer to bend your knees while landing?
4. When an object falls from rest and strikes the ground without bouncing, what happens to its momentum?
5. A fully dressed person is at rest in the middle of an ice pond that exerts no friction force. What can be done to get to the shore?
6. An acquaintance claims that momentum conservation is violated when a ball rolls down a hill and its momentum increases. Comment.
7. Refer to the diagram: Is it possible to use the fan sitting on the sailboat to cause a wind that will then push the boat through the water?



8. While driving in your car (but coasting in neutral at constant velocity with no friction), if an insect hits the windshield of the car, how does its momentum change compare with the car's?
9. A large mass car and a small mass car collide. Which undergoes the greater change in its momentum? Change in velocity?
10. When holding a gun and firing a bullet from it, in which case would it require a larger force of you holding the gun so it doesn't move, when the gun has a larger mass or a smaller mass? Assume in both cases the exit momentum of the bullet is the same.